that men of science were witnessing a secular movement of renovation in France as well as in Germany. Prof. Haeckel then gave an address, containing one of the most uncompromising statements of what he believes to be the logical consequences of his doctrine that has been given by any living evolutionist. We translate from the *Revue Scientifique.*

"The friendly support which I have received in your midst touches me more than I shall say, for it is not only the man and the works which he has been able to produce that you have wished to honour; our profound love of scientific truth, our philosophical beliefs, our faith in the theory of evolution and in that doctrine of descent for which I venture to say I have already fought well, this, gentlemen, is the secret of the sympathy which unites us to-day. I have seen with great joy in the meetings of the scientific congress how the theory of evolution has already, whatever may be said, penetrated the spirit of French *savants.* In the sections of Biology the theory of transformism has appeared to many speakers the only explanation of the phenomena of life which they have studied. The last consequence of that doctrine—the descent of man, not only from the apes, but from all the series of lower organic forms, has even been proclaimed and vigorously defended by M. de Mortillet in the Anthropological Section."

"Prof. Haeckel then proceeded to state the doctrine of the descent of man, so well known in connection with his name. "Certainly," he said, "man does not descend directly from any existing anthropoids. No serious naturalist has professed that doctrine, which has currency only among the general public and theologians. For a long time frivolous and ignorant people have found a subject of pleasant and innocent gaiety in the thought that we wish to pass them off as improved apes. No one dreams of this; but certain professors of philosophy, and a number of facetious preachers, nourish this prejudice, which brings them fine and easy successes. They do not seem to have any idea that they furnish the best argument in favour of that theory, if it is sustainable. Are not their *naïve* pride, their infantine vanity, weaknesses of character which the apes have left us as a legacy? There can be no doubt that man and the apes of the Old and New World are descended from a common ancestor.

"That which, sooner or later, will lead all good minds to transformist doctrines is the feeling, every day more profound among us, of universal causality, of development, of continuity in nature. The number increases every day of those who seek the truth, the whole truth, and who rest only in the clear vision of the universal connection of effects and causes.

"Reason, causality, mechanism, on one side; superstition, mysticism, teleology, on the other. The theory of evolution, which considers and embraces entire nature as one whole, has replaced final causes by efficient causes. This has already been accepted, at least by philosophical minds, the only ones of which we need take count, for the old doctrines of the final causes of the unwise, the immutability of species, sterility of hybrids, geological catastrophes and successive creations, the impossibility of spontaneous generation, and of the youth of man on the earth.

"We cannot say at what moment of time nor under what conditions the first living beings appeared at the bottom of the sea, but there can be no doubt that they have been formed chemically from inorganic carbon compounds. The primitive monads were born by spontaneous generation in the sea, as saline crystals are born of their mother-waters. There does not exist, in fact, any other alternative to explain the origin of life. He who does not believe in spontaneous generation, or rather in the secular evolution of inorganic matter, into organic matter, admits miracle. It is a necessary hypothesis, which cannot be ruined either by *à priori* arguments or by laboratory experiments.

"The time has arrived to replace the antique dualistic and theological conception of life and spirit by the monistic or mechanical conception of the universe. We have arrived at the boundaries of the old and new faith. Mystery exists, perhaps impenetrable; in any case, scholastic arguments will not pierce it. The doctrine of final causes has all the *naïveté* of the explanations which prevail among savages and children; the theories of Lamarck and Darwin have given the last stroke to that decripit doctrine. Modern morphology is irreconcilable, not only, I say, with the dogma of creation, but with that of a Providence or of a vague idealistic Pantheism, of the kind associated with the names of Hegel, Schopenhauer, and Hartmann. If there certainly exists in reality, as I have striven to show, an etiological connection between individual development and the development of ancestry, between ontogenesis and phylogenesis, the phenomena of human embryology are only *mechanical* and necessary effects of the evolution of our remote ancestors, conformably to the laws of heredity and adaptation.

"Seventy years ago, permit me to remind you, the great Lamarck created the theory of descent, which Darwin, half a century after, was to develop by fecundating it with his doctrine of selection, founded on the physiological properties of heredity and adaptation. Goethe had also conceived that doctrine very philosophically. For it is the honour of our conception of things to have seduced philosophers, poets, and critics, such as Kant, Goethe, and Strauss.

"These great and noble geniuses saw imperfectly, gentlemen, that which we see better to-day; I mean to say that the theory of evolution is only a particular case of the most vast of cosmical hypotheses, that of the transformation and conservation of the physical forces. This is what the best minds, the most judicious and wisest, such as the eminent naturalist of Montpellier, of whom France ought to be proud, Prof. Charles Martins, now admit with entire good faith. According to Prof. Martins, in fact, "the theory of evolution binds together all questions of natural history, as the laws of Newton have bound together the movements of the celestial bodies. *That theory has all the characteristics of the Newtonian laws.*"

"Certainly, the laws of life, morphological laws, the laws of transformation of living beings, under the influence of adaptation and heredity, of selection and vital concurrence, are not susceptible of the mathematical rigour of the laws of astronomy. We cannot, however, doubt that they exist, as we do those of psychology, ethology or science of character, and social science. It is, I think, somewhat *naïve* to insist, as is often done, on the numerous anomalies which are observed among living human beings. These anomalies are only apparent as are perturbations in astronomy. If we possessed all the elements of these morphological laws, the solution, at least in part, of which I have at heart, we should see that these apparent anomalies are explained by the general laws of mechanics. No one denies that the extreme instability of the elements constituting the woof of organised beings renders biological problems of an infinite complexity.

"Our mission—to which we have succeeded after the great heroic generation of *savants* of the eighteenth century—for they were heroes, gentlemen, and the greatest of all perhaps, the Laplaces, Lavoisiers, Kants, Lamarcks, Frederick Wolffs—our mission to all, naturalists, physiologists, physicians, philosophers, linguists, historians, is to continue those traditions of powerful thought and manly love of liberty which made our grandfathers almost the equals of those Greeks of Ionia and Attica whom we venerated in our infancy as the fathers of all human science."

PROF. NORDENSKJÖLD ON THE COMPOSITION AND COMMON ORIGIN OF CERTAIN METEORITES [1]

PROF. NORDENSKJÖLD on comparing the composition of the meteorites which fell at Ställdalen in Sweden on June 28, 1876 (NATURE, vol. xvi. p. 238), with that of a number of other meteorites, has found that a remarkable similarity, if not identity, is disclosed by excluding the larger or smaller quantities of oxygen and sulphur which enter into their composition, and taking into consideration only the metallic constituents, irrespectively of their being oxidised or not. This similarity in composition is found to exist between various meteors, which, according to the common method of giving the results of analyses of meteorites, that is, by stating separately the metallic iron, sulphide of iron, soluble and insoluble silicates, &c., appear to be of quite dissimilar nature and composition. The meteorites compared are :—

I. Erxleben, 1812, April 15, analysed by Stromeyer.
II. Lixna, 1820, July 12, analysed by A. Kuhlberg.
III. Blansko, 1833, November 25, analysed by Berzelius.
IV. Ohaba, 1857, October 15, analysed by Bukeisen.
V. Pillistfer, 1863, August 8, analysed by Grewingk and Schmidt.
VI. Dundrum, 1865, August 12, analysed by Haughton.
VII. Hessle, 1869, January 1. *a*, analysed by G. Lindström,

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[1] Abstract of paper in *Trans.* Geol. Union of Stockholm, 1878, No. 44.

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pieces of a large stone; *b*, average of two analyses by Nordenskjöld of whole stones, weighing 1,063 and 0·64 grm.

VIII. Orvinio, 1872, August 31, analysed by L. Sipöez. *a*, chrondritic ground-mass; *b*, black connecting mass.

IX. Ställdalen, 1876, June 28, grey ground mass, analysed by G. Lindström.

Composition of Meteorites, excluding the Oxygen, Sulphur, Phosphorus, and Chlorine found in them.

	Si.	Mg.	Fe.	Ni.	Co.	Mn.	Ca.	Al.	Na.	K.	Cr.	Sn.
I.	26·11	21·79	44·29	2·43	—	0·83	2·13	1·31	0·85	—	0·26	—
II.	26·70	23·61	42·90	2·68	—	0·66	trace	2·12	0·83	trace	0·50	—
III.	26·91	23·22	43·12	1·59	0·09	0·56	1·02	1·85	0·85	0·25	0·42	0·12
IV.	26·12	21·52	47·82	2·75	—	0·18	—	0·23	1·12[1]	—	0·26	—
V.	28·02	22·09	42·99	2·92	—	0·01	0·53	2·07	0·39	0·31	0·53	0·14
VI.	27·55	20·45	44·74	1·58	—	0·44	2·09	0·70	0·72	0·66	1·07	—
VII. *a*.	26·26	21·28	43·57	3·29	0·03	0·50	1·97	1·94	1·05	—	0·08	0·03
b.	26·43	23·07	41·37	3·30	trace	trace	2·28	1·27	1·78	—	0·49	0·01
VIII. *a*.	26·09	21·28	43·29	3·16	—	—	2·46	1·75	1·59	0·38	—	—
b.	26·65	20·18	42·55	4·71	—	—	2·56	1·91	1·10	0·34	—	—
IX.	25·66	21·41	44·83	2·73	0·26	0·29	1·77	1·74	0·71	0·18	0·42	—

Every one who has had experience of the analytical examination of meteorites, which is often very difficult, or at least tedious, writes Prof. Nordenskjöld, and who knows the difficulty of obtaining any proper average sample on account of the preciousness of the material, will perhaps see that here the question is no longer concerning an accidental similarity in the figures obtained, but an actual identity, showing that all those meteorites which have fallen in the course of more than fifty years form a natural group having a common origin. I have not yet been able to treat in the same way all the accessible analyses which, when those that are quite trustworthy are only in question, are less numerous than is commonly supposed. I consider it certain that it will be possible to arrange several other similar natural groups, and that very many other meteorites than those here enumerated belong to this group, which perhaps may be called Hessleites after the most abundant, most completely examined and analysed meteor fall.

It appears to me highly probable that all Hessleites belonged either in a completely metallic or in a *fully* oxidised condition to the same swarm of meteors revolving in our solar system, and that the differences in composition now exhibited by the meteorites belonging to the same group depend on changes to which the meteorites were afterwards subjected by being heated under the influence of oxidising or reducing substances.

With respect to the group now in question it is clear, from the microscopic structure of these meteorites, that the metallic iron forms their most recent constituent, and that it has thus arisen through reduction of the ferriferous silicates.

Where has this reduction proceeded? Probably not in the atmosphere of our globe, though the carboniferous substances which occur in a great number of fire-balls may very well form the necessary reduction material; possibly on the exploded heavenly body, of which these meteorites, according to a sufficiently hazardous and probably incorrect hypothesis, may form fragments; most probably, perhaps, in passing the perihelion, during the revolution of the meteor swarm round the sun.

That, besides, both reducing and oxidising influences, if on a smaller scale, make themselves felt during the short path of the meteors in our atmosphere, is shown on the one hand by the shining iron particles which are often found on the surface of the meteorites, and on the other hand by a comparison of the analyses of the large and small meteorites from Hessle; for while the large contain a considerable quantity of sulphur (1·88 per cent.), the small are nearly free of it (containing only 0·18 per cent.), clearly for the reason that the sulphur in them has been oxidised and driven off.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

FROM the Twenty-fifth Report of the Science and Art Department, we learn that the number of schools examined in 1877 was 1,348, the number of pupils under instruction being 55,927. These numbers are smaller than in 1876. This decrease was entirely due to the withdrawal of physical geography from the list of subjects for which aid is given; for in the remaining subjects a substantial increase had taken place. The subject added to the list when physical geography was withdrawn, viz., physiography, has already secured a large amount of attention; and it is probable that no less than 5,000 candidates will present themselves for examination in it in May next. The above-mentioned 1,348 schools comprised 4,635 different classes, from which 32,112 students came up for examination in May, in addition to 3,230 self-taught students and pupils in classes not taught by certificated teachers. From the results of the examination it is seen that the number of papers passed compares favourably with the statistics of previous years. The number of candidates who came up in honours was 1,029, of whom 85 passed in the first class and 192 in the second class. From the reports on the general character of the examinations which have been received from the examiners, it appears that the results of the examinations are generally of an encouraging nature. Some of these reports contain very valuable suggestions as to methods of teaching, &c., and they have been printed and circulated among the schools. The number of competitors for Whitworth Scholarships in 1877 was sixty-eight. Of these nineteen of the most successful in the theoretical subjects of competition were admitted to go forward to the examination in practical workmanship, which was as in previous years, held at the workshops of Sir J. Whitworth and Co., in Manchester. The Committee of Council state that they have received from the Council of the Royal Society a report of the work done by the gentlemen to whom grants had been made during the year 1877–78 out of the vote of 4,000*l*. for research. This vote was first made in the year 1876–77, the correspondence with reference to it being given in our last, the Twenty-fourth Report, at p. 7 of the Appendix. But owing to the period of the year at which the vote was finally sanctioned, the recommendation of the Council of the Royal Society was not received till March 16, 1877, and only 2,195*l*. 1*s*. 6*d*. came into payment out of that vote, the remainder being returned to the Exchequer. Considering the nature of these inquiries and the time necessarily devoted to preliminary experiments, it was not to be supposed that there would be much definite result to show in the first year. But on the whole very satisfactory progress has been made, and much good work already accomplished, several valuable papers having been contributed to the Royal Society.

WE would draw the attention of teachers in London and its neighbourhood to the admirably organised teachers' classes at St. Thomas Charterhouse School of Science. The session commences on the 28th inst., and those wishing for information should apply to the organising secretary, Mr. C. Smith, at St. Thomas Charterhouse Schools, Goswell Road.

AT a recent meeting of the council of the Yorkshire College, the following appointments were made:—As Lecturer in German and Oriental Languages, Joseph Strauss, Ph.D.; as Lecturer in French, John Willis, Ph.D. Both the new lecturers will commence their duties with the coming session, in October.

WE have received a very elaborate programme of the mathematical courses for the session 1878–9, under Prof. Sylvester, at Johns Hopkins University, Baltimore. Other circulars give a similar announcement in respect to the courses to be followed in languages, chemistry, physics, and biology.

THE University of Helsingfors will celebrate the fiftieth year of its existence during this autumn. The Finlandic University was originally at Abo, and was transferred to Helsingfors in 1828.

THE University of Zürich has just bestowed the title of Doctor of Jurisprudence on a young Russian lady, who obtained the highest honours in her examination for this degree.

AN institution for the higher education of ladies will shortly be opened at Kieff.

SOCIETIES AND ACADEMIES

LONDON

Entomological Society, August 7.—H. W. Bates, F.L.S., F.Z.S., president, in the chair.—A communication was read from Mr. M'Lachlan to the effect that, in the writer's opinion, the larva referred to by Prof. Westwood at the last meeting of the society, as boring in the stems of the potato, was in all probability that of a *Noctua-Gortyna flavago*, polyphagous in the stems of a variety of herbaceous plants.—Mr. S. Stevens exhibited some living specimens of *Teretrius picipes*, parasitic on

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[1] And potash.

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